

Zero Waste

Technology Review

Bio-Plastic Innovations

Back2Earth Technologies, LLC

Food Conversion Model



**On or Near
Existing WWTF**

- Bio-Plastics
- Electricity
- Recycled Water
- Fertilizer
- Separate Food Waste Handling Channel

Zero Waste

AD Extended Use

Unlock Organics in
Food Waste

Two Streams:

1) Bio-Plastics

2) Energy



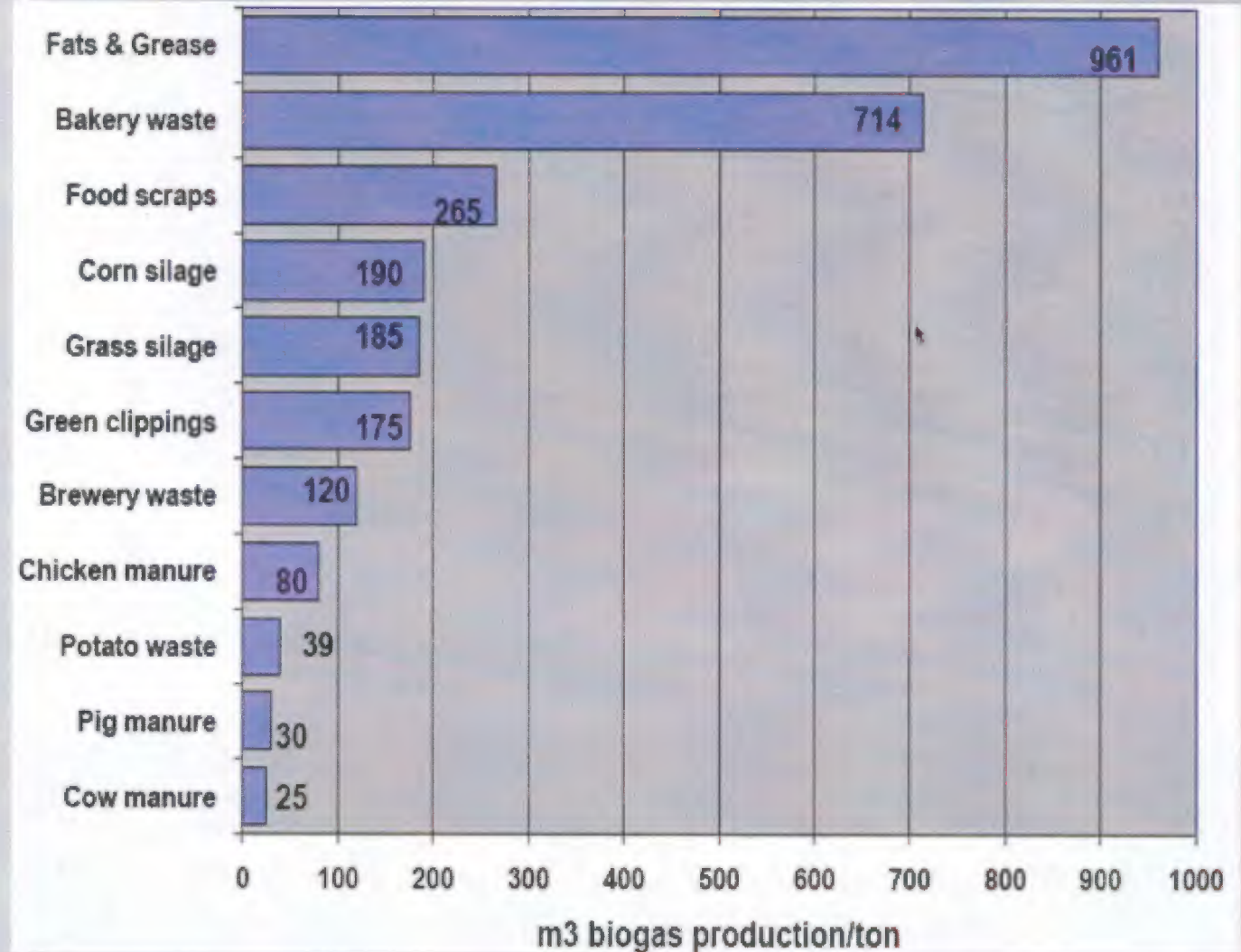
Zero Waste

Biogas Production per Ton

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Acceptable
Waste Streams

Cubic Meter
Biogas
Per Ton



Process Model

Food Waste



B2E Technology



Bio-Plastic Resins



Inject Mold, Extrus, Blown Mold, Film, Lamination

PVC, ABS, LDPE, Pallets, Fiber₅

Managing Microbes

Nutrient Management System

Directs Valve Operation

Monitors Sensors

Determines Effluent Composition

Adjusts Key Variables (A, B, C, D)

Manages HRT / Timing Cycles

Provisional Patent



Scalable

Zero Waste

Process

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Digestion Sequence

The Biochemistry

1 Hydrolysis

Complex organic molecules to soluble

2 Acidogenesis

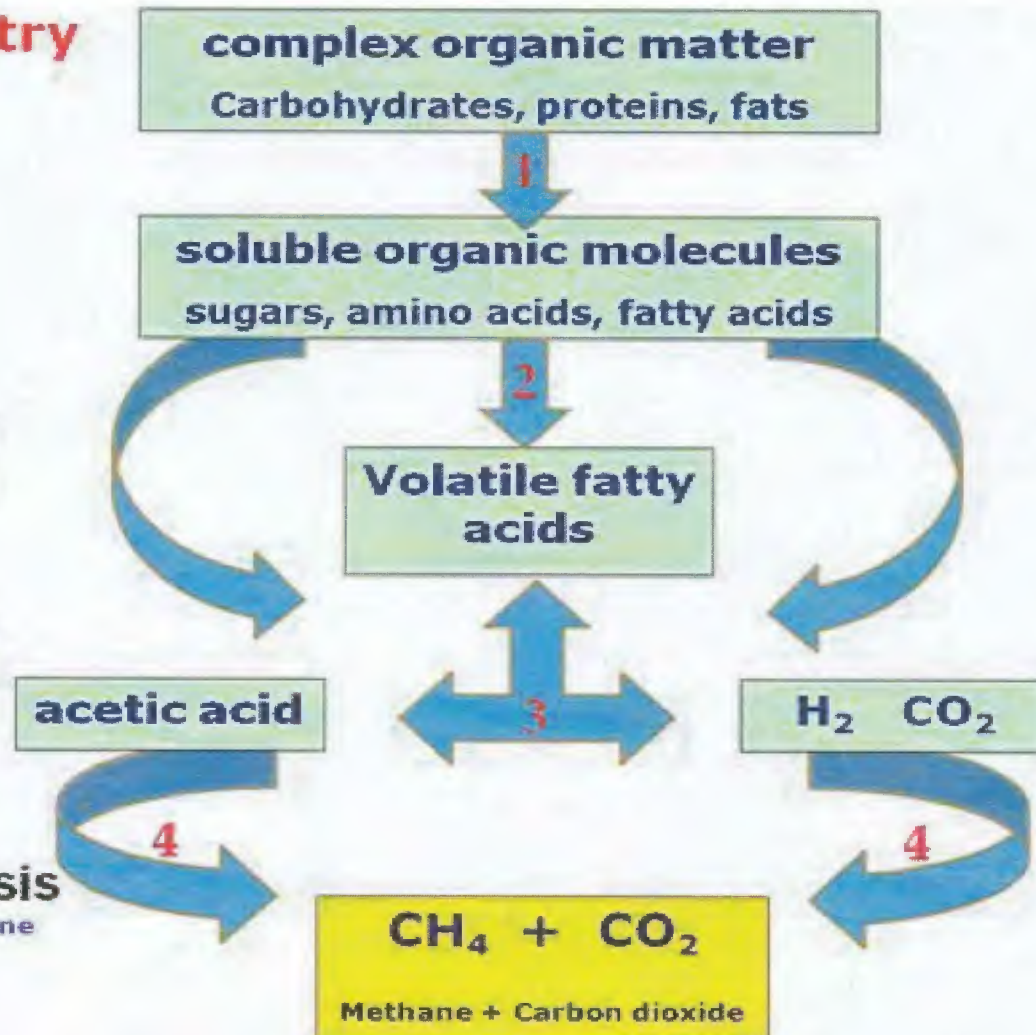
Small organic molecules to fatty acids

3 Acetogenesis

Conversion to acetic acid & CO_2

4 Methanogenesis

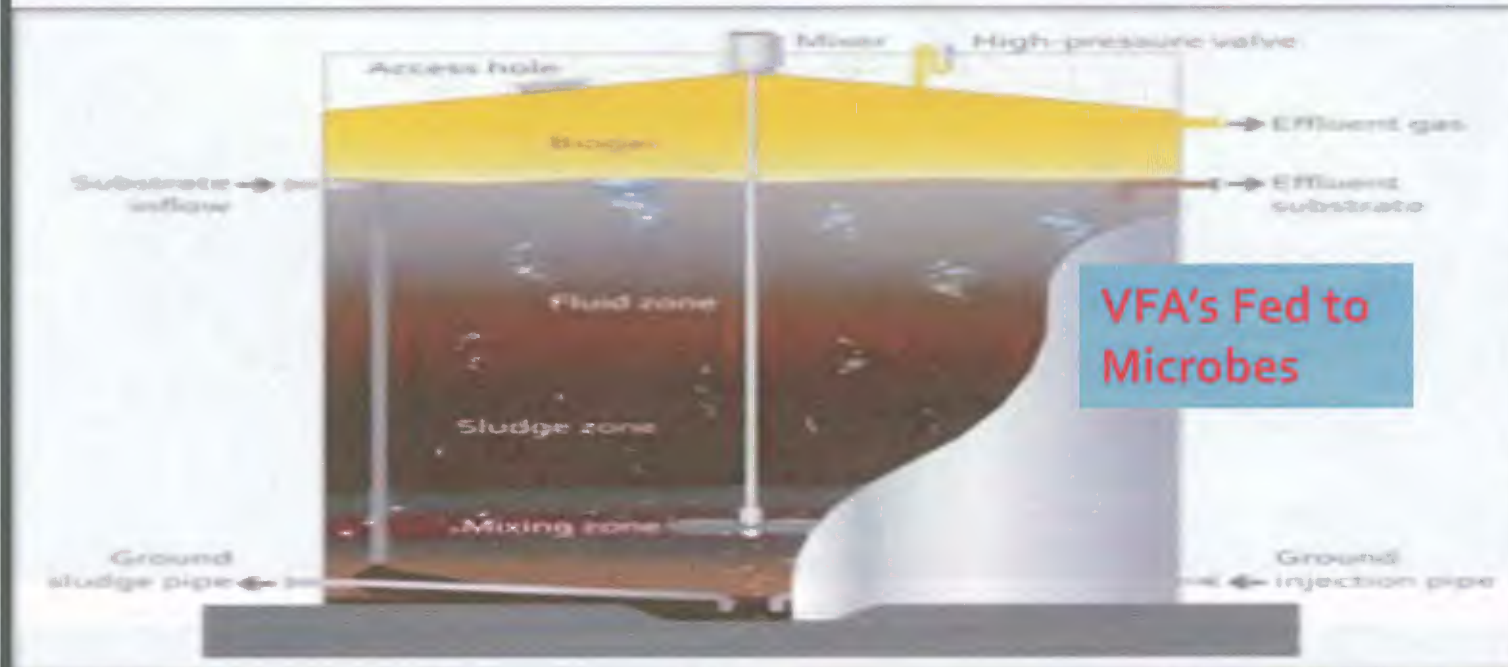
Final conversion to methane [CH_4]



VFA's

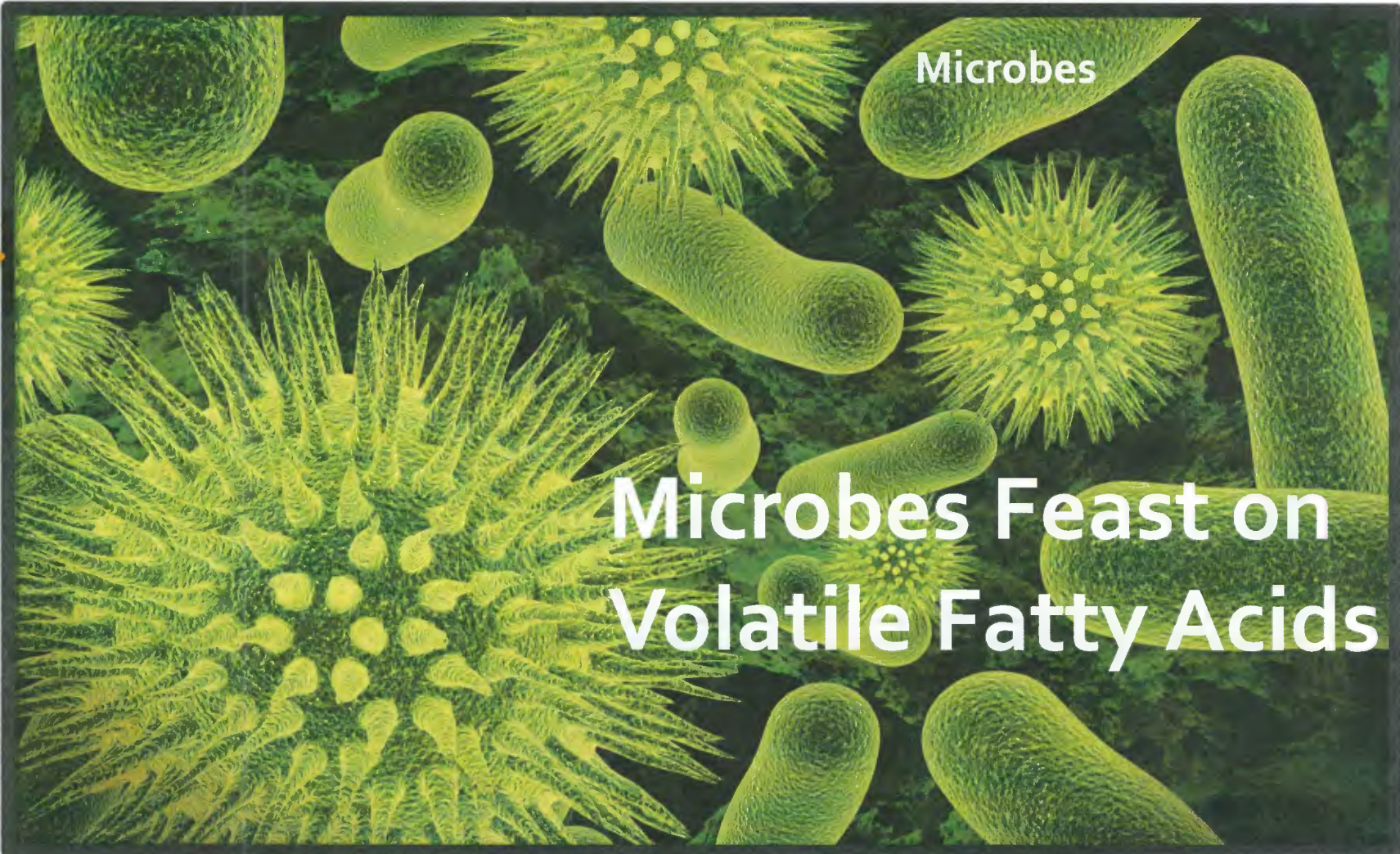
Zero Waste

B2E Technology Accepts
digested food acids.....



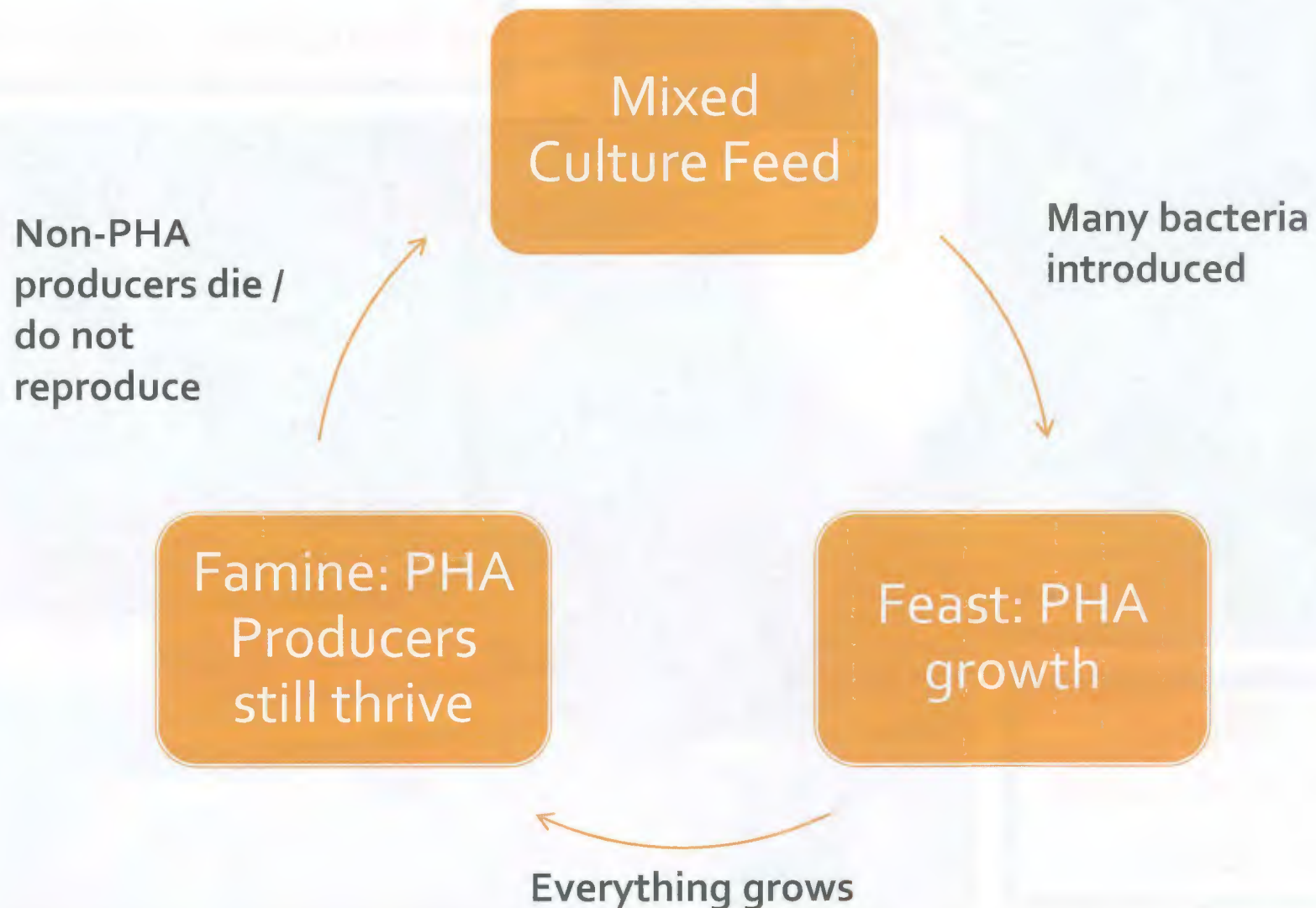
Acid Phase Digester

The Key: Fatty Acids & Microbes



Microbes Feast on
Volatile Fatty Acids

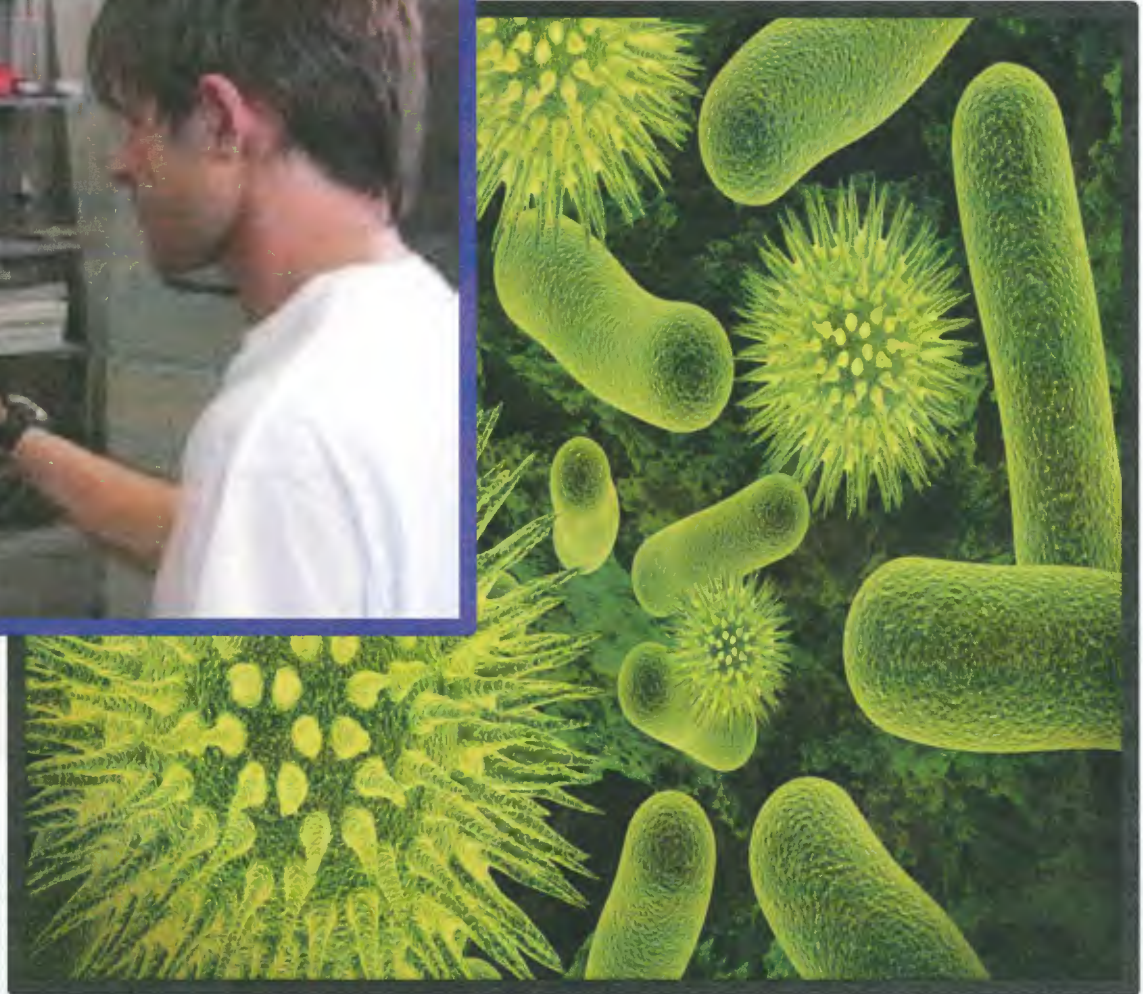
Feast Famine Cycle..use of micro-organisms and a patented methodology



Advanced Nutrient Mgmt System



**Senses Key Parameters
Adjusts Accordingly
Manages HRT
Feast Famine Control**



Bench at Wawona

Zero Waste



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Bench Reactors

Zero Waste



Food Waste to Bio-Plastics Output Model

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INPUT SOURCES

GROCERY WASTE
FOODS

FOOD / BEVERAGE
MFGRS

FOOD SCRAPS

FOG

100
TONS

100
TONS
PER DAY

DAILY OUTPUT B2E BIO-PLASTICS / SALTS

FIBER
COMPOSITE
RESINS

PHA W FIBER

12
TONS

BIO-
PLASTIC
RESINS

PHB

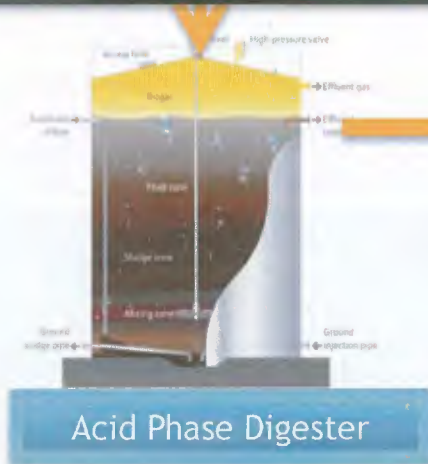
4
TONS

ROAD
SALTS

COMPOST

TBD

YIELD
ESTIMATES



B2E Resins

PALLETS

Natural Fiber Composites

Light Weight
High Tensile Strength

Good Elongation

Low Cost

Broken, Damaged are
Returned to B2E Site

Re-grind, Re-enter into
digester

Fiber Drops Out, New
Resin formed

Bio-Plastic Pallets
(renewable)



Fiber Added to Resin for Extrusion

Zero Waste

Clean Technology

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Summary

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Digestion Sequence

